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Identifying and Mitigating the Impact of the Budget Control Act on High Risk Sectors and Tiers of the Defense Industrial Base: Assessment Approach to Industrial Base Risks

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Panel 10. Assessing Industrial Base Implications of a Constrained Fiscal Climate

Wednesday, May 4, 2016	
3:30 p.m. – 5:00 p.m.	<p>Chair: Lorna B. Estep, Director, Resource Integration and Deputy Chief of Staff for Logistics, Engineering, and Force Protection, Headquarters U.S. Air Force</p> <p>Discussant: Emily Harman, Director, Department of the Navy, Office of Small Business Programs</p> <p><i>Federal Research and Development Contract Trends and the Supporting Industrial Base, 2000–2014</i></p> <p>Andrew Hunter, Director and Senior Fellow, CSIS Gregory Sanders, Deputy Director and Fellow, CSIS Jesse Ellman, Research Associate, CSIS Kaitlyn Johnson, Research Intern, CSIS</p> <p><i>Identifying and Mitigating the Impact of the Budget Control Act on High Risk Sectors and Tiers of the Defense Industrial Base: Assessment Approach to Industrial Base Risks</i></p> <p>Lirio Avilés, Engineer, MIBP, OUSD(AT&L) Sally Sleeper, Senior Advisor, MIBP, OUSD(AT&L)</p>



Identifying and Mitigating the Impact of the Budget Control Act on High Risk Sectors and Tiers of the Defense Industrial Base: Assessment Approach to Industrial Base Risks

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Sally Sleeper—is the Director of the Strategy, Doctrine, and Resources Program at the RAND Corporation. She joined the Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy (ODASD[MIBP]) as the senior advisor in July 2012. In this role, she was responsible for developing tools and techniques to allow analysis of the sub-tier supplier network; developing policy to mitigate risk to National Security; and assessing DoD programs, budgets, strategies, investments, and business combinations that affect defense industry related material production and supply. Dr. Sleeper comes to the Department of Defense from the RAND Corporation, where she was a Senior Management Scientist. From 2008 to 2012, she was the Director of Programs for the RAND Gulf States Policy Institute, with offices in New Orleans, LA, and Jackson, MS. In that role, she worked to develop projects in Louisiana, Mississippi, and Alabama in areas where analysis can help inform decision making and make a difference in the region, such as coastal protection and restoration, healthcare, and workforce development. Her research areas include innovation and technology development, regional economic development, and organizational effectiveness. Previously, Dr. Sleeper was a private-sector Transportation Management Analyst. She received a bachelor's degree in environmental design and planning from the University of Colorado at Boulder, an MS in policy analysis and public management from Stony Brook University, and an MS in organization theory and a PhD in organization science and economics from Carnegie Mellon University. [sleeper@rand.org]

Abstract

The Department of Defense (DoD) requires insight into the risks that the Budget Control Act (BCA) is placing on the defense industrial base (DIB), particularly in those sectors that have been previously identified as critical and at high-risk of losing critical capabilities. The Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy (ODASD[MIBP]) has developed a methodology to identify the impact of budget cuts on the DIB. During 2014 and 2015, the MIBP identified capabilities provided by the DIB that were at high risk of being compromised or unavailable to the warfighter using the fragility and criticality methodology and implemented mitigation plans to sustain the industrial base. Funding to execute mitigation plans was included in the FY16 Presidential Budget. The MIBP created an assessment approach to evaluate the impact of the BCA on the DIB. Only the sectors and tiers previously identified as high risk were assessed. The framework evaluates



the loss of design and manufacturing skills, loss of innovation, loss of competition, and loss of infrastructure. In addition, potential DoD steps to sustain high risk sectors, sub-sectors, and tiers under a BCA environment were identified. DoD leadership is using the results to inform resource decision making.

Introduction

The industrial base is an integral part of the Department of Defense (DoD) force structure needed to provide the highest performance and innovative capabilities to the warfighter. However, the current budgetary situation is forcing industry to make business decisions that will have long term consequences in the nation's ability to advance its technological capabilities. Defense industry consolidations, challenges incentivizing new entrants to the DoD's critical markets, and loss of design teams and manufacturing skills due to procurement reductions are some of the main factors threatening the industrial base. Consolidation trends have led to the creation of six "mega-prime" providers today—reducing competition and creating barriers to entry due to their sheer financial size. Budget uncertainty and industry's perception of DoD contracting practices and intellectual property protection limit the interest of non-traditional companies from working with the DoD. Procurement and research and development (R&D) programs, which have been delayed or cancelled, also have an impact on industry's ability to retain its design teams and exercise the critical manufacturing skills for defense-unique products.

While budget swings are not new to the DoD, the trends and challenges discussed above are impacting today's defense industrial base (DIB) and limiting its ability to support the technological superiority requirements of the Department. In addition, appropriations have consistently fallen short of carefully planned President's Budgets.

As illustrated in Figure 1, the DoD and industry will have to overcome several budgetary challenges:

- The Services need to balance force structure, readiness, and capability to meet national security commitments in their President's Budget submissions. Programs like the Ohio Replacement and Long Range Strike Bombers are part of the U.S. strategy to modernize nuclear weapons systems and the number one priority for the Navy and AF, respectively. In order to fund these programs, the Services will have to make other procurement, readiness, or force structure trade-offs. These decisions are extremely difficult due to competing priorities and their effect on the long-term strategies.
- Current programs are moving from design and manufacturing stages to operations and maintenance. This situation creates a design and manufacturing gap that puts at risk the industry's ability to sustain and exercise the critical skills for the advanced weapons systems required in the future.
- As the war winds down and U.S. forces reduce their role in active combat, the declining demand for some defense-unique products adds pressure to mid and lower tiers of the industrial base that depend on DoD business to achieve their minimum sustainment rates.
- Budgetary uncertainty has contributed to companies' adoption of an income-focused strategy as defense firms invest in share buy-backs, dividends, and mergers or divestitures to create income and improve profitability. Without the ability to plan for future programs, industry is reluctant to invest in R&D, yet



the DoD relies on industry's R&D for innovation, technical dominance, and increased efficiency.

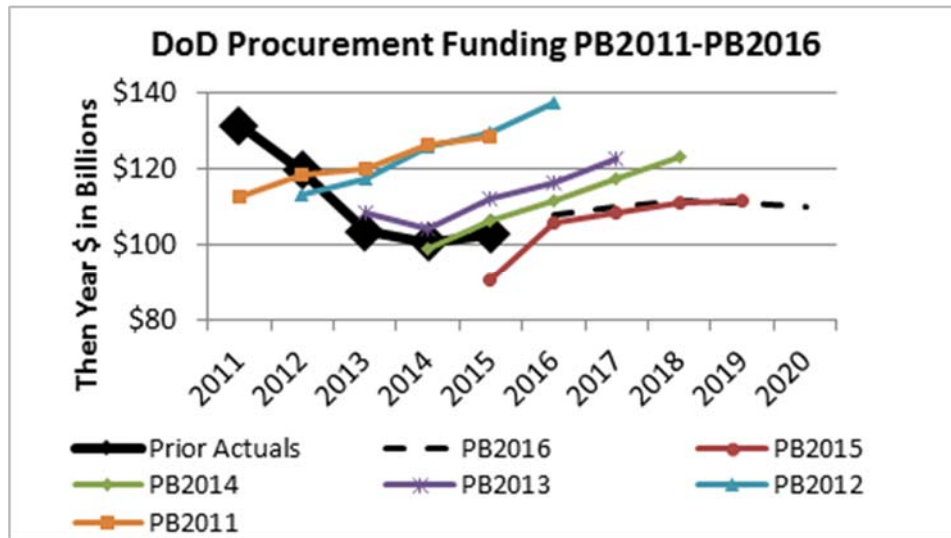


Figure 1. DoD Investments on Procurement—Actuals vs. Presidential Budget (PB)

The current situation of the defense industrial base is exacerbated by the Budget Control Act (BCA) of 2011, which proposed DoD spending reductions of approximately 10% annually for the next 10 years. Figure 2 provides a summary of the events related to the BCA and the effect on the FY16 PB for the DoD. In the National Defense Authorization Act of FY15, Congress expressed concerns about the effect of the BCA on the industrial base. Consequently, Congress requested the Office of the Secretary of Defense to provide an analysis of sectors and tiers of the private industrial base found to be at highest risk, and how the risk assessment has changed since enactment of the BCA of 2011. This paper outlines the framework developed by the Manufacturing and Industrial Base Policy (MIBP) Office to assess the industrial base risks and provides a summary of the results.

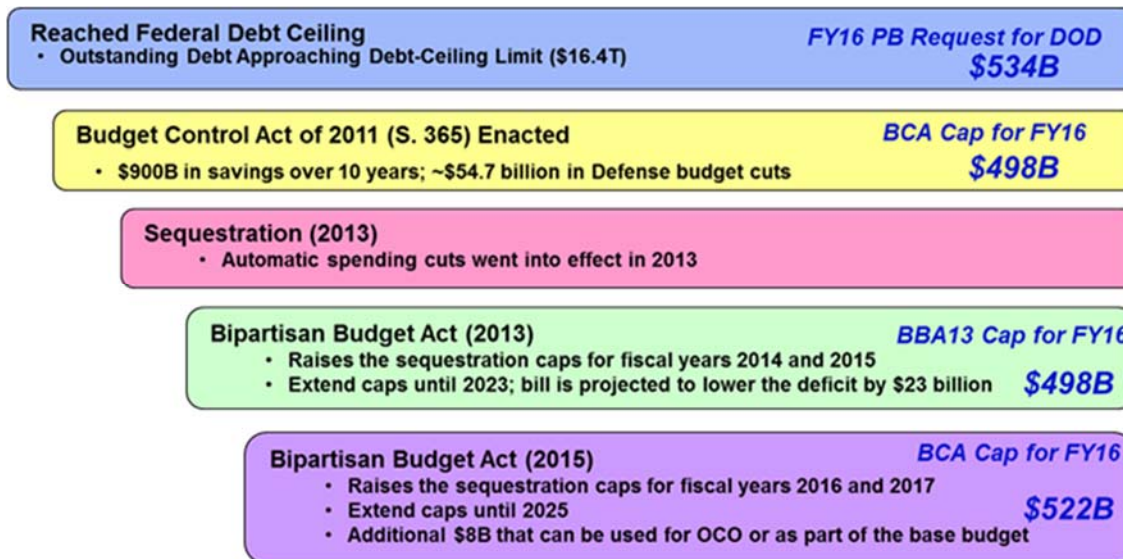


Figure 2. Budget Control Act Events and Effect on FY16 Presidential Budget (PB) for the DoD

Defining Industrial Base Risks

The DoD defines industrial base risks as uncertainties regarding industry's ability to design, manufacture, and sustain the DoD's present and future critical capabilities. A critical capability is defined as a capability difficult to replace if disrupted. A critical capability will have a combination of the following characteristics: defense-unique; requires specialized skills to integrate, manufacture, or maintain the capability; requires defense-specific knowledge to reproduce this capability, an alternative, or the next generation design; requires the use of specialized equipment and/or facilities for manufacturing and sustainment; the time required to restore the capability will have a negative impact on the mission; and the availability of alternatives to meet DoD needs without the capability. The Office of the Deputy Assistant Secretary of Defense for Manufacturing and Industrial Base Policy (ODASD[MIBP]) uses FaC¹ assessments to identify critical capabilities.

The MIBP developed risk definitions (see Tables 1 and 2) to assess the industrial base risks for each sector, sub-sector, tier, and sub-tier, as required. In some cases, the evaluation considered a sub-sector, while in other cases, a tier or sub-tier was assessed. A sector refers to the big segments of the industrial base providing similar or related products and services in a given market. A sub-sector divides the sectors based on more specific activities and/or products. Tiers define the specific components and services required to manufacture a final product. Sub-tiers divide the components and services into specific

¹ In 2011, the MIBP was tasked with developing a forward-leaning approach that could identify the cumulative effect on vital capabilities of procurement decisions across programs and Services. The organization used the existing 1996 framework to develop a methodology that could be used proactively, across Services and industrial sectors, that is rigorous, repeatable, and transparent. That methodology to assess the industrial base is known as the Fragility and Criticality assessment process, or FaC for short.

products, similar to those found in a bill of material. Figure 3 provides an example of the relationship between sectors, sub-sectors, and tiers.

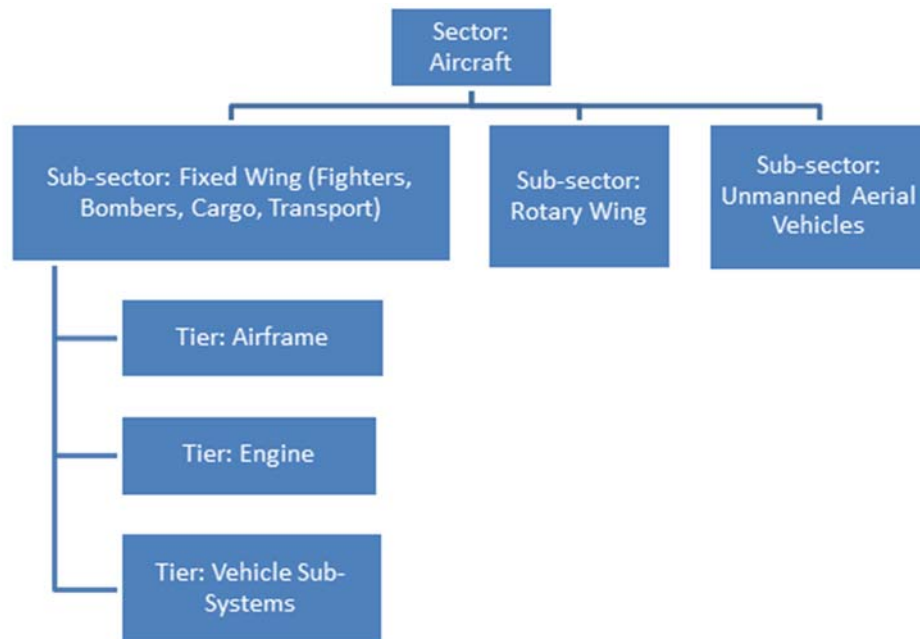


Figure 3. Aircraft—Sector, Sub-Sectors, and Tiers

The analysis framework was based on the two risk components: likelihood and consequence. The risk level ranges from low to high based on the likelihood of losing a critical capability and the ability to reconstitute the capability once it is lost.

Table 1. Industrial Base Risk Definition—Likelihood

Risk Level	Definition
Low	<p>Low expectation that a critical capability will be lost, and, if lost, the capability is easily reconstituted.</p> <ul style="list-style-type: none"> • Industry can quickly respond to DoD requirements on time and at reasonable cost • Competition exists; design and manufacturing skills are being exercised through multiple programs; R&D programs are funded • Adequate infrastructure is available to meet requirements
Medium	<p>Medium expectation that a critical capability may be lost and, if lost, will not easily be reconstituted.</p> <ul style="list-style-type: none"> • Industry has few qualified companies for a capability; declining procurement may reduce domestic competition • Mitigation plans are in place to address a capability where reconstitution would be very costly or to maintain domestic source of supply
High	<p>High expectation that a critical capability will be lost, and, if lost, will be difficult or impossible to reconstitute.</p> <ul style="list-style-type: none"> • Industry has one source of supply, and declining procurement increases the chances of exit • No mitigation action in place; reconstitution would significantly increase cost and schedule • Industry will have difficulty responding to DoD requirements on time and/or at a reasonable cost

Table 2 describes the consequences of losing a critical capability. Consequences are defined according to five main areas that are critical to design, develop, test, and sustain current and future weapons systems: design skills, manufacturing skills, innovation, competition, and infrastructure. One risk may have consequences in multiple areas.

Table 2. Industrial Base Risks Definitions—Consequences

Industrial Base Risks Consequences	Definition
Loss of Design Skills	Loss of defense-specific knowledge required to reproduce a critical capacity, an alternative, or the next generation design
Loss of Manufacturing Skills	Loss of specialized skills needed to integrate, produce, or sustain a critical capability
Loss of Innovation	Reductions in RDT&E funding that will jeopardize technology-based programs. Industry is focusing R&D investments on near-term payoffs.
Loss of Competition	Procurement levels that cannot sustain multiple suppliers will lead companies to exit the market. Markets also may consolidate through increased mergers and acquisitions and partnerships between primes and suppliers.
Loss of Infrastructure	Loss of specialized equipment or facilities needed to integrate, manufacture, or maintain a critical capability. Lack of investment to maintain and modernize the equipment, tooling, and facilities needed to sustain the capability.

Defining Industrial Base Sectors at Risk

The MIBP used the results of FaC assessments conducted between 2013 and 2014, industrial base reports, and inputs from subject matter experts to identify sectors at high risk of losing critical capabilities, considering factors like current and future demand, acquisition phase of major programs, and mitigation strategies. The following sectors were identified at higher risk:

- **Missiles and Munitions Sector**—The missile and munitions sector is comprised of the DoD's smart bombs and tactical and strategic missiles. This sector is primarily a defense-unique industrial sector and, therefore, is highly dependent on the DoD's demand. Over the past decade, the munitions and missile sector has provided no new-start missile opportunities, as all "new" missile programs have been designated as, or have become, upgrades to existing systems.
- **Space Sector**—The space sector is primarily driven by the commercial market and includes satellites, launch services, ground systems, networks, payloads, propulsion, and electronics. Although the commercial focus of this sector allows leveraging the commercial technology advancement, security restrictions limit the benefits. Therefore, the DoD must remain vigilant in order to maintain critical capabilities that are specialized for military applications and have very low demand compared with commercial products.
- **Aircraft Sector**—The aircraft sector is comprised of commercial and defense aircraft. Defense aircraft are divided in three main sub-sectors: fixed-wing, rotary wing, and unmanned systems. The fixed-wing sub-sector includes



fighters, bombers, cargo, and transportation aircraft. The rotary wing sub-sector includes helicopters used for combat, combat support, and services. Unmanned aircraft systems include the necessary components, network, and personnel to control an unmanned aircraft, including a launching element, if needed. There has been a steady decline in the number of defense development programs for fixed-wing and rotary wing aircraft. Modernization programs will help sustain important capabilities, but will not provide opportunities for major design, development, and integration work. Design shortfalls are also projected because much of the defense aerospace workforce is close to retirement, and the pool of young engineers available to replace them is migrating to other industries.

- **Shipbuilding Sector**—The defense shipbuilding sector is comprised of seven shipyards and other shipyards which concentrate on commercial ships, but will periodically enter and exit the naval market. The U.S. shipbuilding industrial base depends on DoD business to sustain critical design and manufacturing skills, as well as to maintain their current infrastructure.
- **Combat Vehicles Sector**—The ground vehicle sector is generally categorized in two broad vehicle classes: tactical wheeled vehicles (TWV) and combat vehicles. The TWV are usually commercial trucks modified for military use in demanding environments and/or missions. This type of truck benefits from dual-use or commercial demand. Combat vehicles, on the other hand, are typically heavily armored and integrated with complex weapons and systems; therefore, they have limited commercial application. This sector faces a number of industrial base challenges, including retaining critical design and integration skills, as well as sustaining critical suppliers in the sub-sector tiers.

Specific sub-sectors, tiers, and sub-tiers were identified in each of the sectors previously mentioned. Information about the specific risk is not discussed in this paper to protect business sensitive and pre-decisional information used in the analysis. However, an example of the aircraft sector, which has been openly discussed by DoD leadership, is provided in the next sections.

Risk Level Assessment

Risk level assessments for each of the sectors, sub-sectors, and tiers identified at high risk were conducted using the following timeframes:

- FY11 (baseline) – BCA enactment
- FY13 – Bipartisan Budget Act enactment
- FY15 – Current FY at the time of the assessment
- FY16 – Most current guidance for investment on the next five years at the time of the analysis

The assessment was based on the number of DoD programs supporting the sectors at high risk over the time periods under evaluation and the acquisition phase of those programs.

The final product was a risk level matrix for each of the industrial areas. Figure 4 provides an example of the aircraft sector assessment. In this case, the assessment was done at the sub-sector level, fixed-wing-fighter aircraft. In 2011, there were multiple programs in manufacturing, and the F-35 program was supporting development activities. In



2013, there were still multiple programs in production, but the F-22 closed their production line and the F-35 development activities decreased. By 2015, most of the fighter programs were transitioning from a manufacturing phase to operations and sustainment. In addition, no new design work for fighters was expected, creating a development gap until the 2020s, when new fighter programs are expected to start. The FY16 PB included funds to start a program known as the Aerospace Innovation Initiative (AII). This program will help to sustain the development skills required to produce the next-generation of fighters, maintain competition in the sector, and promote innovation.

Although the medium level indicates that mitigation plans are in place to address the risk, capabilities in the medium risk level will be highly dependent on budget decisions. Funding for mitigation plans may be transferred or delayed in order to fund higher priorities within the Department. Sub-sectors in this risk level should be monitored constantly.

Sector: Aircraft	2011	2013	2015	PB2016
Sub-Sector: Fixed Wing - Fighters				

Figure 4. Industrial Base Risk Level (Likelihood)—Aircraft Example

Identifying the Effect of the BCA on the Defense Industrial Base

Funding cuts due to the BCA will create additional barriers to overcome the current challenges. However, the impact of the BCA cannot be assessed in isolation. Decreasing procurement and R&D funds, Services' priorities, the scheduled end of multiple DoD programs, and corporate strategic plans are other factors that will impact the industrial base and are considered when making decisions related to the BCA.

The MIBP used the following sources to determine the impact of the BCA:

- Presidential Budget—PB16 projects funding levels for FY16 to FY20. The trends in procurement and R&D budgets provide a good indication of the expected investments in the defense aircraft sector (see Figures 5 and 6). The fighter procurement and RDT&E funding stay relatively steady from 2018 to 2020 due to the F-35 program. However, there is no new fighter development or procurement during that period of time. The decreasing trend in procurement and RDT&E investment may be worsened by the implementation of BCA cuts.

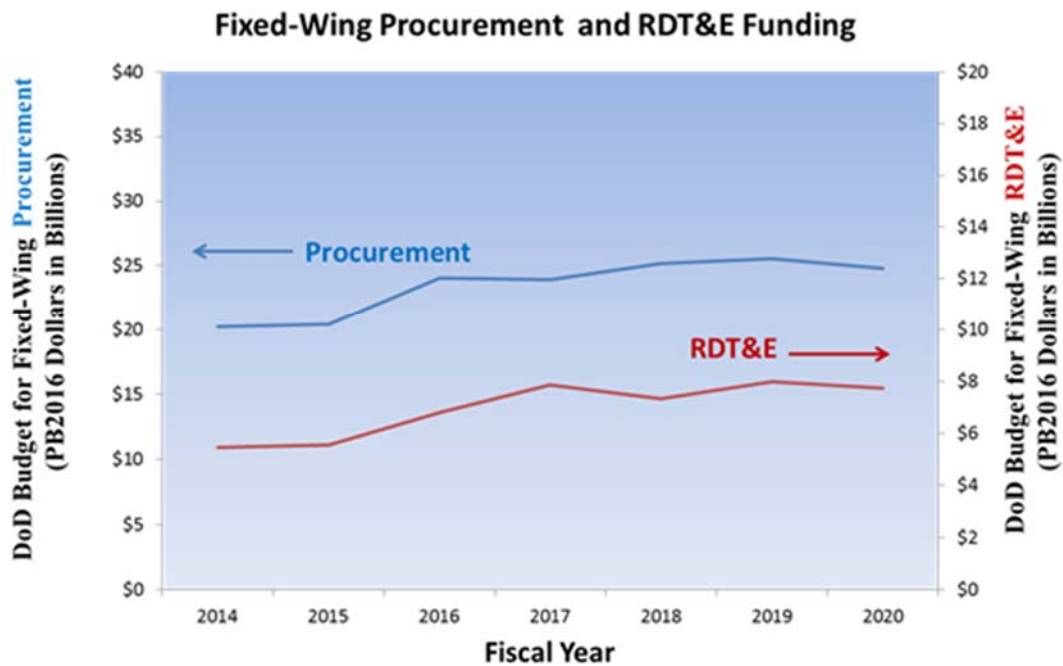


Figure 5. DoD Investments in Fixed-Wing Procurement and RDT&E (PB16)

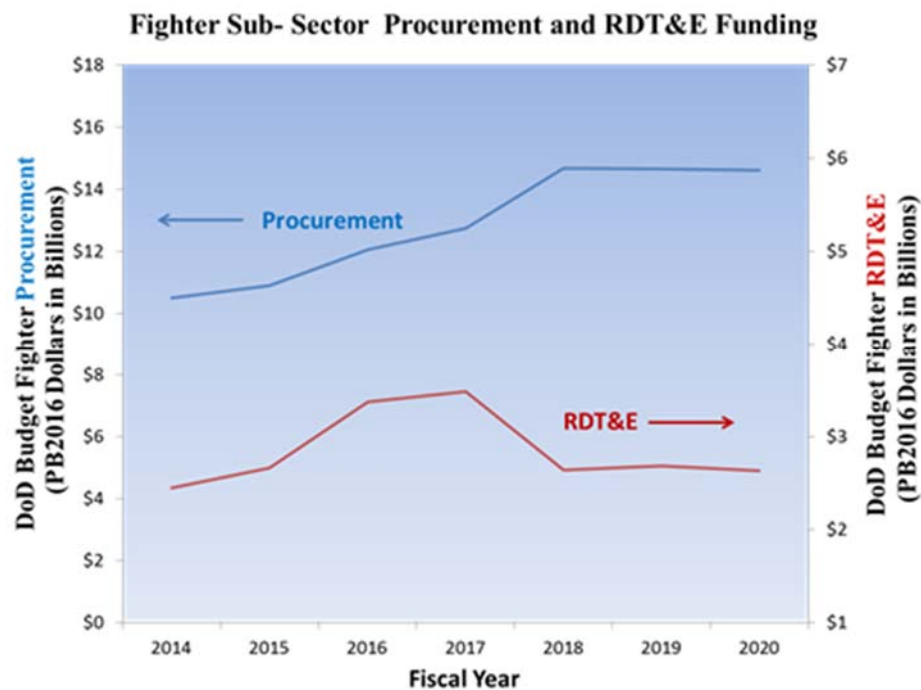


Figure 6. DoD Investments in Fighter Aircraft Procurement and RDT&E (PB16)

- Subject matter experts (SMEs) from the Services and representatives of multiple DoD offices evaluated the potential impact of BCA enactment in FY16 to their current programs and plans. The following potential impacts were identified for the fixed-wing-fighter sub-sector:

- Aerospace Innovation Initiative (AII) funds may be eliminated.
- RDT&E programs to advance sixth generation fighter technology may be reduced or eliminated.
- BCA16-driven divestiture or reduction of aircraft fleets may affect primes and lower tier suppliers that are essential to capabilities sustainment.
- SMEs applied the definitions in Table 2, industrial Base Consequences, to assess expected consequences if a capability is lost due to a BCA cut implementation.

Sector: Aircraft	Loss of Design Skills	Loss of Manufacturing Skills	Loss of Innovation	Loss of Competition	Loss of Infrastructure
Sub-Sector: Fixed Wing - Fighters	✓	✓	✓	✓	✓

Figure 7. Industrial Base Risks (Consequences)

Updated Risk Assessment—The risk level was updated to reflect the potential impact of the BCA in FY16. It is important to note that the actual BCA impacts will depend on the Services' budget and decision priorities at the time of the BCA cuts implementation. In the case of the fixed-wing-fighters sub-sector, the likelihood of losing critical capabilities increased.



Figure 8. Industrial Base Risk Assessment Including Potential BCA Impact

The Final Outcome

To finalize the analysis, a combination of all the factors assessed was provided for each sector and its respective sub-sectors and tiers (see Figure 9). DoD leadership will use this combination of factors to determine the industrial base risk levels and consequences in specific areas of the industrial base and make decisions about the potential cuts. For example, in Figure 8, the fighter aircraft risk level is expected to change from medium to high if BCA cuts are implemented. This could represent the elimination or delay of funds for a new program or implementation of a mitigation strategy. BCA implementation will require reducing or re-programming funds based on priorities. Leadership will use these data to establish priorities based on the risk level and consequences they are willing to accept. The risk level needs to be paired with the consequence when establishing priorities.

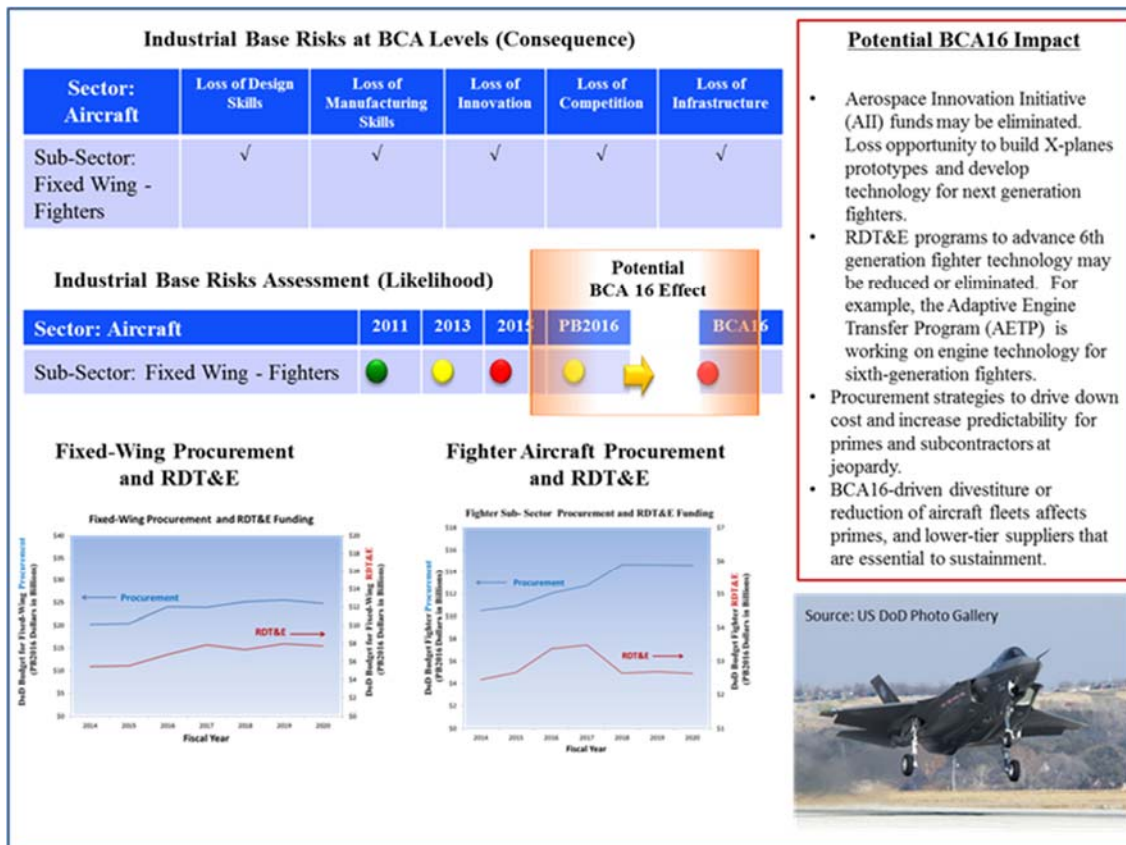


Figure 9. Potential Impact of BCA on Industrial Base—Fixed-Wing Fighters Example

Conclusion

The results of the analysis provided the following conclusions:

- BCA levels would have a significant negative impact on major sectors of the defense industrial base: The FY16 Presidential Budget included considerations and mitigation strategies necessary for a healthy industrial base capable of providing critical capabilities to the DoD. However, many of the DoD's remediation efforts to protect high risk sectors and tiers may be at risk under the BCA.
- The DoD's future actions to reduce the potential impact of BCA16 on the industrial base will depend on the cuts across the Services to reduce costs while balancing force structure, readiness, and capability to meet current and future national security demands.
- Policy changes and additional actions may be necessary to sustain the industrial base.

- The DoD can take the following steps to help sustain high-risk sectors and tiers under a BCA environment:
 - Develop acquisition strategies that promote competition while sustaining design and manufacturing skills.
 - Expand the use of available tools and program² to mitigate industrial base risks.
 - Continue working on FaC assessment to identify critical capabilities at risk and develop mitigation strategies through groups like the Joint Industrial Base Working Group (JIBWG)³ and the Industrial Base Counsel (IBC).⁴

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² Examples of industrial base tools and programs include the Industrial Base Analysis and Sustainment (IBAS) funds, the ManTech program, and Title III. IBAS provides temporary sustainment for critical defense-related industrial capabilities that are temporarily at risk of being lost. ManTech provides the primary investment mechanism for enabling defense essential manufacturing capability. Title III authorizes economic incentives to create, expand, or preserve critical domestic industrial manufacturing resources.

³ The JIBWG conducts industrial base assessments and recommends investment priorities.

⁴ The purpose of the IBC is to drive a forward-looking view of the defense industrial base enterprise, ensure alignment to overarching objectives, and enable more effective decision making at all levels. This group is comprised of executive leadership who will set priorities for the defense industrial base, including assessments, risk mitigation, and a clear pathway for escalation of issues.





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Impact of the Budget Control Act (BCA) on the Defense Industrial Base (DIB)

Presentation for the 13th Annual Acquisition Research Symposium

May 2016

OUSD-AT&L-Manufacturing and Industrial Base Policy

Mrs. Lirio Aviles

Dr. Sally Sleeper



Purpose



Provide an analysis of sectors and tiers of the private industrial base found to be at highest risk, and how the risk assessment has changed since enactment of the BCA of 2011.

- MIBP did the study before the Bipartisan Budget Act of 2015.
- Areas at high risk were previously identified using Fragility and Criticality assessment, industrial base reports and SMEs inputs.
 - **Missiles and Munitions**
 - **Aircraft**
 - **Combat Vehicles**
 - **Space**
 - **Ships**



How can we assess the impact of the BCA cuts on the defense industrial base?



- ***There are multiple challenges affecting the DIB***
 - Need to balance force structure, readiness and capability to meet national security commitments.
 - Declining demand for defense-unique products
 - Industry's Income-focused strategy
 - Development & Manufacturing Gaps - Programs moving from development and manufacturing stages to operations and maintenance stages.
 - Budgetary Uncertainty – Inability to plan. Appropriations have consistently fallen short of PB.
 - Aging Workforce
- ***Funding cuts due to the BCA will create additional barriers to overcome current challenges.***
- ***BCA cuts impacts cannot be assessed in isolation.***




Impact of the BCA cuts can be measured by the likelihood of losing critical capabilities and the consequences of that loss



High Risk Industrial Base Sectors & Tiers

Likelihood

- What is the probability of losing a critical capability?
- How easily can the capability be reconstituted?

Likelihood		Definition
	Low	Low expectation that a critical capability will be lost and, if lost, is easily reconstituted
	Medium	Medium expectation that a critical capability may be lost and, if lost, will not easily be reconstituted
	High	High expectation that a critical capability will be lost and, if lost will be difficult or impossible to reconstitute

Consequence

- What are we losing?
 - Design Skills
 - Manufacturing Skills
 - Innovation
 - Competition
 - Infrastructure

Consequences	Definition
Loss of Design Skills	Loss of defense-specific knowledge required to reproduce a critical capability, an alternative, or the next generation design
Loss of Manufacturing Skills	Loss of specialized skills needed to integrate, produce or sustain a critical capability
Loss of Innovation	Reductions in RDT&E funding that will jeopardize technology-based programs. Industry is focusing R&D investment on <i>near-term</i> payoffs.
Loss of Competition	Procurement levels that cannot sustain multiple suppliers will lead companies to exit a market. Markets also may consolidate through increased mergers and acquisitions, and partnerships between primes and suppliers.
Loss of Infrastructure	Loss of specialized equipment or facilities needed to integrate, manufacture, or maintain a critical capability. Lack of investment to maintain and modernize the equipment, tooling, and facilities needed to sustain the capability.

DoD defines IB risks as uncertainties regarding industry's ability to design, manufacture, and sustain present and future DoD's critical capabilities.



Risk Assessment Approach: Likelihood Example

Sector: Aircraft	2011	2013	2015	Potential BCA 16 Impact		
Sub-Sector: Fixed Wing - Fighters				PB2016 		BCA16

- Program transition
- Development Gap
- Aging Workforce

Risk Level	Definition
Low	Low expectation that a critical capability will be lost and, if lost, is easily reconstituted
Medium	Medium expectation that a critical capability may be lost and, if lost, will not easily be reconstituted
High	High expectation that a critical capability will be lost and, if lost will be difficult or impossible to reconstitute

Potential Effect of BCA cuts on Procurement and RDT&E funding (Aircraft-Fixed Wing- Fighters Example)

- Aerospace Innovation Initiative (AII) funds may be eliminated.
- RDT&E programs to advance 6th generation fighter technology may be reduced or eliminated.
- BCA16-driven divestiture or reduction of aircraft fleets may affect primes and lower-tier suppliers that are essential to capabilities sustainment.

Sequestration would put a hold on critical programs like our Aerospace Innovation Initiative, the Next Generation Adaptive Engine, ..." Secretary of Defense Ashton Carter, March 2015



Industrial Base Risks: Consequence Example



Sector: Aircraft	Loss of Design Skills	Loss of Manufacturing Skills	Loss of Innovation	Loss of Competition	Loss of Infrastructure
Sub-Sector: Fixed Wing - Fighters	√	√	√	√	√

Consequences	Definition
Loss of Design Skills	Loss of defense-specific knowledge required to reproduce a critical capability, an alternative, or the next generation design
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Risk Assessment Approach: Likelihood and Consequences

Industrial Base Risks at BCA Levels (Consequence)

Sector: Aircraft	Loss of Design Skills	Loss of Manufacturing Skills	Loss of Innovation	Loss of Competition	Loss of Infrastructure
Sub-Sector: Fixed Wing - Fighters	✓	✓	✓	✓	✓

Industrial Base Risks Assessment (Likelihood)

Sector: Aircraft	2011	2013	2015	PB2016	BCA16
Sub-Sector: Fixed Wing - Fighters					

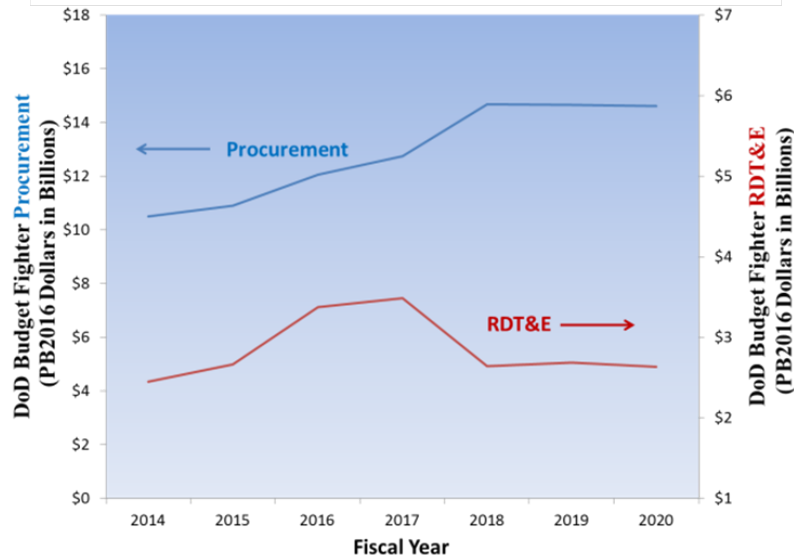
Potential BCA 16 Effect



Potential BCA16 Impact

- Aerospace Innovation Initiative (AII) funds may be eliminated. Loss opportunity to build X-planes prototypes and develop technology for next generation fighters.
- RDT&E programs to advance 6th generation fighter technology may be reduced or eliminated. For example, the Adaptive Engine Transfer Program (AETP) is working on engine technology for sixth-generation fighters.
- Procurement strategies to drive down cost and increase predictability for primes and subcontractors at jeopardy.
- BCA16-driven divestiture or reduction of aircraft fleets affects primes, and lower-tier suppliers that are essential to sustainment.

Fighter Aircraft Procurement and RDT&E



Source: US DoD Photo Gallery





Summary of Findings

- BCA levels would have a significant negative impact on most major sectors of the defense industrial base.
 - Many of DoD's remediation efforts to protect high risk sectors and tiers will be at risk.
 - Remediation programs to help manage IB risks and challenges may be extremely limited or unavailable at BCA levels.
- DoD's future actions to reduce the potential impact of BCA on the industrial base will depend on the cuts across the Services
- Additional actions may be necessary to sustain the industrial base
 - Acquisition Strategies, Increase Efficiencies, Partnerships

*U.S. ability to maintain technological superiority and meet National Defense needs
will diminish if industrial base risks are not mitigated*